sumption. That is doubtless true, but the simple fact remains that throughout the anxious days of the food crisis, thanks to the patriotism and courage of the many farmers who voluntarily broke up grass last year, the nation possessed in reserve this valuable store of food available, if required, at short notice, and through the enterprise of the Food Production Department of the Board of Agriculture can face any future emergency with still greater confidence. Individual farmers who secure less than an average crop of corn may suffer loss on this year's crop, but there will be few cases in which subsequent crops, drawing upon the fertility accumulated in the soil throughout the many years under grass, will not satisfactorily redeem any present loss.

NOTES.

THE important question of supplementing supplies of mineral oil by the distillation of cannel coal and allied bituminous minerals has been recently investigated by two separate committees. Whilst the possible production from home sources can amount to but a fraction of the total requirements of motor-spirit, fuel-oil, etc., yet such quantity as might be furnished by the raw materials which are available would undoubtedly tell appreciably in reduction of the tonnage at present required for the importation of oil. That large quantities of oil can be obtained from such material cannot be questioned, but with the reduction in labour, particularly at the mines, and with other demands for constructive material which would be required for the erection of retorts and refineries, the problem of utilising these sources must be dependent on the most economical use of available labour and material under existing conditions. The Government Committee presided over by Lord Crewe considers that a largely increased production cannot be obtained without interfering with other not less important industries (Cd. 9198). The Committee appointed last February by the Institution of Petroleum Technologists has considered the question as an immediate war measure, and as a permanent commercial undertaking and a measure of reconstruction, and in an interim report urges the War Cabinet to lay down a definite policy as to the relative national value of coal and oil, and the provision of the necessary labour, raw materials, and transport; to grant facilities for the erection at suitable centres of plant to those who are prepared to find the capital; to establish at once an experimental station where retorts to a design provisionally approved by the institution may be tested, or, failing such a Government station, to grant all necessary and reasonable facilities to the institution for erecting a station of its own. Whilst present conditions may determine that operations on a commercial scale are not immediately justified, there can be little question as to the economic soundness of such experimental investigations as are required to establish an oil industry as a measure of reconstruction which would be wholly beneficial to the nation.

IN a recent letter to the *Times* Mr W. J. Malden raises again the old question whether science has done or can do anything for the farmer. The occasion of the letter was Mr. Prothero's speech in the House of Commons containing a tribute to the work of Prof. Biffen on the breeding of wheat—a tribute which most people would think was well deserved. Mr. Malden objects on the ground that "there is nothing new of far-reaching value that the man of science can place in the hands of the farmer at this moment. . . . All that has been done by those practising Mendelism is puny as compared with what Garton and Findlay have done." But no Government Department proclaims their work, and no honours are bestowed on them. The claim would scarcely be worth rebutting did it not represent the attitude of some of the less informed farmers, who hold that there is nothing new under the sun, and that science in particular can teach them nothing. This opinion was at one time fairly common, but it has been steadily dying out during the present generation. In an ancient and highly individualised industry like farming there has been such an enormous variety of practices that, if one goes far enough back over a sufficiently wide field, it is possible to find anticipations of most of the modern improvements. It would be disingenuous to argue, however, that farmers have known these things for generations. It is true that Messrs. Garton and Findlay have improved crops. But they have made no additions to our knowledge; they have kept their secrets to themselves, and no one can practise or develop their methods. It is untrue that their work has remained unrecognised; the community has paid them handsomely for their products. The man of science does not keep his secret to himself, but gives it to the world so that others may benefit thereby; he makes no fortune, and Mr. Malden and those who think similarly should not begrudge him such meagre recognition as he obtains. In the early days of artificial manures it was not uncommon for certain writers to maintain that these substances, being new, could not possibly be useful. Yet the scientific investigator persisted, and to-day the use of artificials is a regular feature of husbandry. We do not wish to fall into the opposite error and overlook the enormous help rendered to agriculture by business men. We must, however, point out that the man of science not only provides a new appliance, but also teaches how and why to use it; all experience shows that intelligent men claim to know why they should do a particular thing in a particular way. This science alone can teach.

THE death is announced, at fifty-two years of age, of Dr. F. E. Batten, physician to the National Hospital for the Paralysed and Epileptic, London, and distinguished by his scientific work in neurology.

THE Conrad Ealte-Brun prize of the French Geological Society has been awarded to Prof. L. Martin, of the University of Wisconsin, for his researches on the glaciers of Alaska.

PROF. THEODORE W. RICHARDS, of the Wolcott Gibbs Memorial Laboratory at Harvard University, has been elected a foreign member of the Accademia dei Lincei, Rome.

THE exploration of the cave known as "Ghar Dalam," Malta, referred to by Prof. A. Keith in NATURE of July 25, p. 404, has been assured for the present year. Besides the sum of 50*l.* given by Sir Thomas Wrightson, Bart., Dr. Robert Mond has placed 50*l.*, and Dr. Charles Singer 10*l.*, at the disposal of the committee in charge of operations.

IT is stated in the *British Medical Journal* that the National Medical Institute of Mexico, which was founded in 1890 for research on the flora, fauna, climatology, and geography of Mexico, and for the exploitation of these resources, has by a recent decree been transformed into the Institute of General and Medical Biology.

WE learn from the *Times* that a special general meeting of the Royal Society was called for Wednesday, July 31, to consider the following motion submitted by Sir George Beilby and Dr. M. O. Forster:—"That, in view of the war having continued during nearly four years without any indication that the scientific men of Germany are unsympathetic towards the abominable malpractices of their Government and their fellow-countrymen, and having regard to the representative character of the Royal Society among British scientific bodies, as recognised by the patronage of his Majesty the King, the council forthwith take steps necessary for removing all enemy aliens from the foreign membership of the society." The council of the society has had the matter under consideration, and decided to refer the question of expulsion to a conference of representatives of Allied academies to be held in October next. This decision was approved by the meeting, which adopted the following resolution:—"That the delegates of the Royal Society at the forthcoming conference with the representatives of the academies of Allied countries should raise the question of the expulsion of enemy foreign members, with the view of eliciting the opinion of the conference as to the desirability of joint action, and that the subject be reconsidered at a future meeting of the society on the report of the delegates."

The Board of Agriculture and Fisheries has appointed a Committee to study the life-habits of the honey-bee with the object of improving the conditions under which bee-keeping is carried on in England and Wales, and to investigate the epidemic diseases of the bee, more especially the disease or group of diseases which pass under the name of "Isle of Wight disease." The Committee consists of the Master of Christ's College, Cambridge University (Dr. A. E. Shipley, F.R.S.), Prof. R. C. Punnett, F.R.S. (professor of genetics, Cambridge University), Dr. G. S. Graham Smith, Prof. G. C. Bourne, F.R.S. (professor of zoology and comparative anatomy, Oxford University), Prof. W. Somerville (professor of rural economy, Oxford University), Mr. T. W. Cowan (chairman of the British Bee-keepers' Association), Mr. G. W. Bullamore, Mr. J. C. Bee Mason, and Mr. A. G. L. Rogers (head of the Horticulture Branch, Board of Agriculture and Fisheries). Mr. R. H. Adie will act as secretary. It is proposed to undertake the study of healthy bees at Cambridge and the investigations on "Isle of Wight disease" at Oxford. The Committee will be glad to receive specimens of bees suspected of suffering from "Isle of Wight disease" for examination and experiment. Communications on this subject should be addressed to Mr. Rogers at 4 Whitehall Place, London, S.W.1.

July this year stands out meteorologically as wet and rather cool. The especial feature was the heavy rainfall, which was essentially of a thunderstorm type. At Greenwich the aggregate rainfall for the month was 7·37 in., which, according to the series of observations from 1815, is the wettest July on record, and there has only been one wetter month at any time of the year, October, 1880, with 7·65 in. The excess of rain at Greenwich is 5·32 in. In the week ending July 13 the rainfall was 2·48 in., and on the two days, July 11 and 17, in thunderstorm rains, the total measurement at Greenwich was 3·03 in., whilst at Camden Square the rainfall for the same two days was 0·99 in. and at Kew 1·07 in. At Tulse Hill the total rain for July was 7·62 in., and at Wandsworth Common 7·16 in., whilst at Kew the fall was only 4·65 in., and at Camden Square 4·92 in. The weekly weather reports published by the Meteorological Office show that July was wet over nearly the whole of the British Isles, there being an excess of rain in all districts except in Ireland N. The data for the four weeks ending July 27 practically give the rainfall for the whole of July, as the closing days of the month were fine. The wettest district was Scotland N., where the measurement was 4·54 in., and it was 4·50 in. in Scotland E.; the wettest district in England was the S.E., with 4·43 in. The driest district was Ireland N., where the measurement was 2·81 in. Very little rain fell during the opening week, and in many parts of England the period was rainless. The mean temperature at Greenwich was 62·4°, which is 0·4° below the normal, and the absolute highest temperature was 82° Over the British Isles generally the greatest deficiency of temperature occurred in the second week, ending July 13, when in parts the deficiency was from 3° to 4° F. Sunshine was not very different from the normal.

Prof. P. D. Hahn, whose death at the age of sixty-nine occurred on March 9, had occupied the chair of chemistry at the South African College, Capetown, since 1876. He was a South African by birth, the son of a German missionary stationed in Great Namaqualand. He received his early education in Germany, whither his parents had returned during his infancy. After graduating at Halle he studied in London and Edinburgh, eventually returning to Capetown in 1875. Throughout his career Prof. Hahn manifested a keen interest in the agricultural progress of South Africa; he helped in the establishment of an Agricultural Department for Cape Colony, and the recent institution of faculties of agriculture at Pretoria and Stellenbosch Colleges was an outcome of his advice. He had broad scientific sympathies, however, and urged upon the authorities the need for providing scientific instruction in mining and other subjects, as well as in agriculture. The present School of Mines and Technology at Johannesburg has grown out of the scheme which was devised as the result of his representations to this end, and it was on his recommendation that Government chemical laboratories were established in Capetown. Prof. Hahn was twice president of the Cape Chemical Society, and was also president in 1911 of the South African Association for the Advancement of Science. He had been a member of the council of the Cape of Good Hope University for forty-two years.

M. Charles Joseph Etienne Wolf died at Saint-Servan on July 4 at the age of ninety. He was born at Vorges, near Laon, being an Alsatian by descent. He was appointed professor of physics at Nîmes in 1851, afterwards in succession at Metz and Montpellier; he made pioneer researches at Montpellier, in company with M. Diacon, on the temperature changes in the spectra of metallic vapours. In 1862 he accepted Le Verrier's offer of an important post at the Paris Observatory; the great meridian circle and other new instruments had just been installed, and he took a large part in superintending the scheme of observations, paying special attention to the personal equation. He designed an instrument for its investigation, which was adopted in many observatories. Later he introduced a system of synchronised clocks, first in the observatory, afterwards throughout Paris. M. Wolf made, in conjunction with M. Rayet, the important discovery of the Wolf-Rayet stars with bright-line spectra, which play a large part in theories of cosmogony, a subject on which he was himself a fruitful writer. He investigated the proper motions of stars in clusters, especially in the Pleiades and Præsepe. He took a large part in preparing for the transits of Venus, investigating the Black Drop, etc. His old age was occupied with writing historical memoirs on the former standards of length, on those of the metric system, and on the Paris Observatory He retired to Vorges, his birthplace, where he delighted to welcome the descendants of his only daughter. In 1914 the German invasion obliged him to leave his home, and he moved to Saint-Servan, where he died. M. Wolf was elected a member of the Paris Academy of Sciences in 1883, and was its president in 1898. He was elected an associate of the Royal Astronomical Society in 1874.

MR. J. REID MOIR describes in *Man* for July a floor recently discovered at Ipswich containing some implements of the Early Mousterian period. A full account of the stratification of the site is given, with drawings of the implements discovered in the course of the excavation. It is at present somewhat difficult to correlate this discovery with that of the Aurignacian floors previously examined in the same neighbourhood, but further research may render this possible. The bones found are identified by Prof. A. Keith as those of an elephant, reindeer, ox (*Bos primigenius*), and goose, many of them showing splitting for the extraction of the marrow

IN the current issue of *Folklore* (vol. xxix., No. 2) Mr. W. Crooke contributes a paper on "The Home in India from the Point of View of Sociology and Folklore." The evolution of the form of the house, which in Western societies is often obscure, can be effectively examined among the castes and races of the Indian Empire, more or less completely isolated by distinctions of race and belief. The various forms assumed by the houses in India are fully described. One of the most primitive is that of the round house, of which there are some survivals, often in the form of churches in Europe, derived from the habit of bending down the pliant branches of some tree like the bamboo to form a temporary shelter. This also accounts for the curvilinear form of the Buddhist stupa, or receptacle for relics. The great pillared halls of the Mogul palaces are similarly derived from the reception pavilions of Central Asia. The occupation of a house marking a crisis in social life, a *rite de passage*, as Continental anthropologists describe it, gives rise to numerous taboos and precautions in order to disperse the evil spirits which occupy the site. The site selection, the laying of the foundation-stone, and the erection of the roof-beams are in the same way regulated by elaborate ceremonies. One curious phase is when a man, acting as a "scape-goat," is sent into the house before the owners occupy it, in order to take on himself the dangers to which they would otherwise be exposed.

THE question of the preservation of paper in India has recently been discussed at the All-India Conference of Librarians at Lahore. Mr. W. Railt, the cellulose expert, who read a paper on the subject, remarked that the problem was not new in England, America, or Germany. But these investigations have little applicability to the problem in tropical climates. Sir Aurel Stein found paper produced from linen or cotton rags in Central Asia in the fifth or sixth century A.D. still fresh and crisp. Complaints of the deterioriation of paper in India date from the introduction of rag substitutes after 1860. Within the next fifty years most of the reports and documents for which such paper was used will, he believes, be unreadable, while those of an earlier era will be quite sound. This is a very serious statement, and the conference passed a resolution advising the Government to undertake an inquiry into the whole subject, and impressing on them the urgent necessity of securing a supply of paper capable of permanent preservation for all records of permanent value. Mr. Chapman, of the Imperial Library, Calcutta, remarked in the course of the discussion that he had made a list of books in that institution published between about 1790 and 1870 the paper of which had perished badly. This list was sent to the British Museum, and the authorities reported that their copies of these books were in perfect condition. The factor of climate is therefore of great importance in the case of books printed on paper made of rags and forms of cellulose.

IN the *Revue Scientifique* for June 8 MM. Sartory and Blaque review the bacteriology of war-wounds. A large proportion of these are infected with various species of bacteria, because the fragments of the projectiles, principally shrapnel, are soiled with earth, and may also carry into the wound fragments of clothing likewise soiled with earth. From about the ninth hour after infliction the microbes that have gained access begin to multiply in the wound, in particular certain anaerobes, such as the *Bacillus perfringens* group and the organism of malignant œdema, which are concerned in the production of gas-gangrene. Then the *Bacillus coli* begins to grow, and by about the twentieth hour streptococci and staphylococci appear, associated with numbers of saprophytic bacteria. Supposing that the patient survives and gas-gangrene does not occur, the wound becomes an ordinary suppurating one from the seventh to the twentieth day. At this stage the anaerobes disappear and the pus-producing organisms become paramount—cocci, *Bacillus coli, B. proteus,* and *B. pyocyaneus.*

DR. JAMES RITCHIE, in the *Scottish Naturalist* for June, records the occurrence of a giant squid (Architeuthis) stranded in the neighbourhood of Skateraw, on the eastern coast of Haddingtonshire, on November 2, 1917. The body had suffered mutilation at the hands of the curious before Dr. Ritchie arrived on the scene, but he was enabled to obtain important notes and measurements, which he records at length in his communication. The body, from the tip of the tail to the base of the tentacles, measured 5 ft. 9 in.; while the stalked arms measured 14 ft. Unfortunately the beak had been removed, as also had the pen, though portions of this were found on the beach. The eyes also were missing, a fact which is the more regrettable, since these afford valuable specific characters. From a careful study of these remains the author is of opinion that this squid may be identified as *Architeuthis harveyi* of Verrill, and marks the only definite occurrence of a giant squid on the coast of Great Britain.

TWO valuable papers, on the morphology of the vertebræ of the Temnospondyli and Stegocephalia, and on the osteology of some American vertebrates, by Mr. S. Williston appear in Contributions from the Walker Museum, Chicago (vol. ii., No. 4). The author remarks that while no material differences are apparent between the skulls of Edaphosaurus and Naosaurus, or between the parts of the appendicular skeleton, yet there exist well-marked differences in the spines of the cervical vertebræ, since in Naosaurus these are broadly dilated and thickened at the extremity, while in Edaphosaurus they are slender and pointed. The author is fortunate in being able, for the first time, to describe and figure the complete skull of Naosaurus, inasmuch as this has enabled him to set at rest some doubtful points in regard to this genus and its allies. Finally, the author describes a new genus and species of the Diplocaulidæ. The remains on which the new genus is founded were obtained in the Craddock bone-bed, near Seymour, Texas.

THE recently issued Bulletin of the Imperial Institute (vol. xv., No. 4) contains several papers of economic importance. Among them may be mentioned a useful article on the peas and beans of commerce, and another on the various useful fibres of the Belgian Congo. In view, however, of the world's demand for oils and fats for the manufacture of margarine, the article on the oil-seed industry of Rhodesia is worthy of more particular attention. It seems probable that the cultivation of oil-seeds may become an important industry in Rhodesia. Ground-nuts and sunflower-seeds are the only oil-seeds produced commercially at present, but experiments conducted at the agricultural stations indicate that success may attend the cultivation of other oil-seeds. Castor-seed, sesame, and linseed have recently been sent from the Government gardens, North Rhodesia, to the Imperial Institute, as well as sunflower, and have been found to be entirely satisfactory. Before the war sesame-seed was chiefly crushed on the Continent, and the inclusion of its oil in margarine was compulsory. This, on the outbreak of the war, naturally raised the price of sesame oil considerably, and cheaper and equally good oils were adopted as substitutes. If, however, the Rhodesian sesame-seed can be successfully grown and the oil be procured in this country at a cheap rate, the industry may well have an important future before it, for sesame-seed is now being crushed in this country, and the Rhodesian seed will be a valuable addition to the available supply of seed.

ACCORDING to the *Revue générale de l'Electricité*, a Dutch company has taken out French Patent No. 480,857 for a thermic telephone, in which the strength of reproduction of the voice may be regulated as required. The result is obtained by giving the instrument the form of groups of thermal conductors, superposed or placed side by side in the same box, and mounted on removable supports and conductively joined to each other, so that the number can be chosen according to the requirement of the person using the telephone.

FRENCH Patent No. 483,519 describes an incandescent electric lamp with spiral filament capable of giving a concentrated beam of light and high candle-power. This is effected (*Revue générale de l'Electricité*, April 20) by using a projecting mirror cooled by the continuous circulation of water or air between the walls of which it is formed. The mirror is placed inside the bulb of the lamp. The cooling water may be passed through coils, and it helps at the same time to cool the gas and increase its circulation in the bulb. Thus it is possible to raise the temperature of the filament and so obtain a greater candle-power and efficiency.

OCCASIONALLY an alloy of two or more metals which is known to possess good elastic properties will, for some unknown reason, fail under a stress much below its normal breaking stress. The cause of such failures in the case of brasses of the Muntz metal type has been investigated by Messrs. P. D. Merica and L. W. Schad, of the Bureau of Standards, whose work on the subject forms Scientific Paper 321 of the Bureau. As brasses of the type considered consist of solid solutions of α and β brass in each other, the authors have measured the rates of expansion with rise of temperature of the two constituent brasses. They find that while α brass expands at a nearly uniform rate from 100° C. to 600° C., β brass only expands at the same rate over the range 100° C. to 300° C., then at a considerably greater rate to 500° C., after which it again agrees with the α brass. From this it follows that when a brass containing both constituents is rapidly cooled over the range 500° C. to 300° C., stresses will be set up at the surfaces of contact of the two constituents, and in one case the decrease of strength of a specimen treated in this way amounted to 2000 lb. per sq. in. The authors state that other alloys are to be investigated, and the results will be awaited with much interest.

AT one time there were a good many three-cylinder locomotives in this country, but they were all of the compound type. Mr. H. N. Gresley, of the Great Northern Railway, has brought out a three-cylinder high-pressure engine operated by two valve gears, and a description of this locomotive will be found in the *Engineer* for July 26. The engine, which is an eight-coupled coal locomotive, has been at work for some time, and appears to be fulfilling all expectations. Charts taken on a dynamometer car show that the engine starts much more easily than a corresponding two-cylinder engine, and owing to its more uniform turning moment the draw-bar pull is exceptionally steady. At present this engine forms a class by itself, but after the war is over it is probable that others of the same type will be constructed.

SOME methods of reclamation of industrial waste products are described in an article in the *Times Engineering Supplement* for July. In some cases metal cuttings and scrap from machine tools have been subjected to treatment for the recovery of the oil used in cutting prior to disposal of the scrap to metal refiners. One case is cited of a prominent motor-car manufacturing firm recovering 1200 gallons of cutting oil per week, the oil being used over and over again on similar work, while the fresh oil necessary to make up for wastage amounted to only 10 per cent. of the total required. A turbine-centrifugal separator is used, with steam, for the dual purpose of propellant and liquefier. The oil contained in cotton-waste and cloths used for cleaning machinery, mopping up oil, etc., deserves more consideration than it usually receives. In numerous cases such materials, thrown away after first use, are of greater value than new materials. In an installation of the most complete type the dirty material is first passed through a turbine separator in order to extract the oil, which is ready for use again after purification. If the material has been used on comparatively clean work, it is ready for re-use as it comes from the separator; otherwise it is advisable to wash it in a machine resembling the ordinary laundry machine, and then partially to dry it in a hydro-extractor prior to final drying in cabinets or automatic rotary machines. With such a plant, turning out six tons of clean, dry rags per week and involving a capital expenditure of 2200*l*., a saving of about 450*l*. has been effected in three months' working. Sixty-seven tons of rags and 4080 gallons of oil were reclaimed in this period, and the reclaimed oil was used as fuel for Diesel engines.

THE twelfth annual report of the Executive Committee of the British Science Guild, just issued, contains a special reference to the aims and objects of the British Scientific Products Exhibition, to be opened next week at King's College, London. A series of interesting memoranda issued by the Education Committee is also included, dealing respectively with the Education (No. 2) Bill, scholarships for higher education, and the teaching of science. In a report on the introduction of the metric system, which was recently brought before the Ministry of Reconstruction, some concrete suggestions to facilitate legislative compulsion are made. Importance is attached to the adoption of metric measures in Government publications inviting tenders, etc., and their general introduction in schools and colleges. A report on the British dyes industry directs attention to the very large capital employed for this purpose in Germany and to the need for a complete statistical survey of the present condition of the industry in this country, with the view of preventing overlapping of effort. A full account is given of the addresses delivered by Lord Sydenham, Sir Algernon Firth, and Sir Henry Newbolt at the annual meeting on June 19. The offices of the Guild are at 199 Piccadilly, London, W.1.

MR. BERNARD QUARITCH, having acquired the stock of "Biologia Centrali-Americana" from Dr. F. Du Cane Godman, is offering the work, either complete or in separate sections, at reduced prices. A prospectus explaining the origin and development of the "Biologia Centrali-Americana," and giving particulars of the contents of each of the sixty-three volumes, has been prepared by Mr. Quaritch, and will be sent to readers of NATURE upon application being made for it to 11 Grafton Street, New Bond Street, W.1.

OUR ASTRONOMICAL COLUMN.

THE PERSEID METEORIC SHOWER.—The maximum of this brilliant annual meteoric shower will probably occur on Sunday night, August 11, and the best period for observation may be expected after midnight. The first traces of the shower were recognised on July 8 by Mrs. Fiammetta Wilson at Totteridge and by Miss A. Grace Cook at Stowmarket. A meteor was mutually recorded by them on that date and found to be a true Perseid, with a radiant point at $8^\circ+49^\circ$. Another member of the stream was seen by the same observers on July 12, and the activity of the display has been increasing nightly. On August 5, at 13·54 G.M.T., a splendid Perseid brighter than Venus was seen by Mr. Denning at Bristol traversing a path from $269^\circ+84\frac{1}{2}^\circ$ to $230^\circ+65^\circ$. With suitable weather there should be a rich display of Perseids this year.

RADIAL VELOCITY OF β CANIS MAJORIS.—In 1908 the star β Canis Majoris, of magnitude 2·0 and type B1, was found by Albrecht to be a spectroscopic binary with the very short period of about six hours. A further study of the star has recently been made by Dr. F. Henroteau, in which special efforts were made to secure continuous series of plates during the same revolutions (Lick Obs. Bull., No. 311). The mean velocity, of +35 km. per second, appears to be constant, but the range of velocity has been found to vary very considerably from one period to another, being sometimes as low as 3 km., and at other times as much as 18 km. per second. This variation in range shows no simple periodicity, but does not seem to be a discontinuous function. It is remarkable that while there is no period which connects and represents the different minima of velocities, a period of 0·25714 day, starting from a given maximum, always corresponds with either a maximum or a minimum of the velocity curve. It has been further noted that the spectral lines undergo a periodic change in width, the amplitude being always approximately the same, and the period 0·25130 day. This variation seems more likely to be due to physical changes in a single body than to the combination of two spectra, but no satisfactory explanation of all the peculiarities of the star has yet been found. Adopting Mitchell's parallax of $+0{\cdot}009''$, the star would be about 1000 times as bright as the sun.

RELATIVITY.—A paper by Jun Ishiwara on relativity (Proceedings of the Tokyo Mathematico-Physical Society, second series, vol. ix., No. 16, May, 1918) is based on the assumption that the gravitation potential is completely represented by a scalar quantity ψ; the components g_{hk} of the fundamental tensor of the time-space transformation and the scalar c (velocity of light *in vacuo*) are functions of ψ. It follows that the field-intensity is given by the gradient of ψ in space. The expressions for g_{hk} and c in terms of ψ are found with the aid of Poisson's equation, and the author deduces in an independent manner the same expression for the advance of the perihelion of a planet during one revolution as that already given by Gerber and Einstein, which is known to agree with the observed value in the case of Mercury.

Dr. L. Silberstein demonstrates in Monthly Notices of R.A.S. (May, 1918) that an unexpected consequence of Einstein's theory is that all homogeneous bodies must be spherical; he considered that this was a strong argument against the truth of Einstein's views. Prof. Eddington, in the discussion which followed, remarked that the principal bodies known to us in space do, in fact, approach very closely to the spherical form, and, further, that a perfectly homogeneous body is difficult to conceive, since there must be some differences of pressure, and therefore of density, in different portions of it.

THE SUPPRESSION OF BODY-VERMIN.

A COMPREHENSIVE paper entitled "Combating Lousiness among Soldiers and Civilians," by Prof. G. H. L. Nuttall, appears in *Parasitology* for May (vol. x., No. 4). The paper is one of a series which, when complete, will constitute an exhaustive monograph on human lice. It brings together, not only the available published information, but also that resulting from hitherto unpublished research work, partly the author's own, and partly that of others contained in reports to the War Office, which he has been permitted to use. Prof. Nuttall has generously presented a special edition of three hundred copies of the paper to the Allied Armies; and, in view of the recently established fact that trench fever is conveyed by lice, this should prove a very timely gift.

The paper comprises 176 pages, with four plates and twenty-six figures in the text. Most of the pages are devoted to the practical consideration of louse destruction, a great deal of the experimental evidence being given in detail. The results obtained demonstrate that nits are killed by dry heat at 65°–70° C. in one minute, and at 55°–61° C. in ten minutes, the active stages being killed by dry heat at 65°–70° C. in one minute and at 55° C. in five minutes. After allowing for a margin of safety in practice, immersion in hot water at 70° C. for a minute or two is amply sufficient to destroy lice, while 55° C. for ten minutes is equally effective, a point of great importance in relation to the washing of flannel garments.

Singeing, sun-baking, and the use of hot flat-irons are briefly dealt with. The various methods devised for disinfestation by hot air and steam are treated of at length, and illustrated by text-figures of disinfestors improvised for war purposes, together with plates depicting the more elaborate forms of disinfectors designed for use in peace-time. We agree with the author that apparatus designed with a view to high efficiency against the resistive spores of bacteria is not adapted for rapid and economical use against lice. It should be replaced by more commodious hot-air and steam huts, or disinfestors planned on the improvised railway vans said to have been so successful in the East. Designs of this type of chamber should also be adapted for steam or motor lorries, as well as trailers, which could, if necessary, be horse-drawn.

Steam gives results superior to hot air if the destruction of pathogenic bacteria is an object, but dry heat possesses many advantages over steam if the destruction of body-vermin is the end in view. The use of sulphur is treated of at some length. We endorse the author's remarks as to the failure of sulphur vapour to destroy all the nits exposed to it, while its relatively high cost, the danger of injury to clothing, and its slow action are further disabilities of the method.